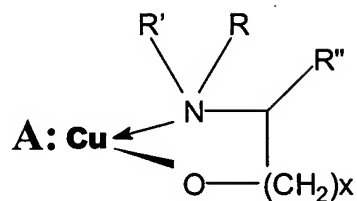


THE CLAIMS**What is claimed is:**

1. A compound of formula (I):



(I)

wherein:

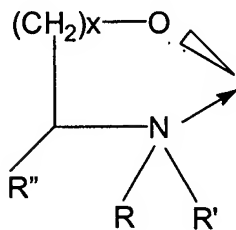
Cu is Cu(I) or Cu(II);

x is an integer having a value of from 0 to 4;

each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl;

when Cu is Cu(I), A is a Lewis base;

when Cu is Cu(II), A is:



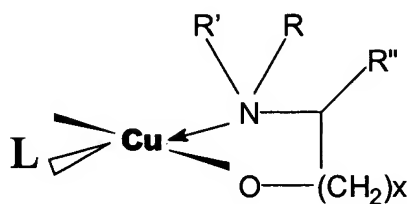
wherein x, R, R' and R'' are as specified above.

2. The copper precursor of claim 1, wherein Cu is Cu(I).

3. The copper precursor of claim 2, wherein the Lewis base is selected from the group consisting of alkenes, alkynes, dienes and diynes.

4. The copper precursor of claim 2, wherein the Lewis base is selected from the group consisting of alkene, diene, cycloalkene, cycloalkadiene, cyclooctadiene, cyclooctatetraene, alkyne, substituted alkyne (symmetrical or asymmetrical), amine, diamine, triamine, tetraamine, ether, diglyme, triglyme, tetraglyme, phosphine, carbonyl, dialkyl sulfide, vinyltrimethylsilane, and allyltrimethylsilane.

5. A copper precursor of the formula (II):



(II)

wherein:

x is an integer having a value of from 0 to 4;

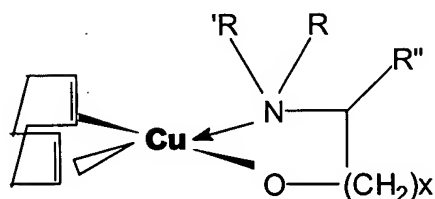
each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl; and

L is a Lewis base coordination species.

6. The copper precursor of claim 5, wherein the Lewis base coordination species is selected from the group consisting of alkenes, alkynes, dienes and diynes.

7. The copper precursor of claim 5, wherein the Lewis base coordination species is selected from the group consisting of alkene, diene, cycloalkene, cyclodiene, cyclooctadiene, cyclooctatetraene, alkyne, substituted alkyne (symmetrical or asymmetrical), amine, diamine, triamine, tetraamine, ether, diglyme, triglyme, tetraglyme, phosphine, carbonyl, dialkyl sulfide, vinyltrimethylsilane, and allyltrimethylsilane.

8. A copper (I) precursor of formula (III):



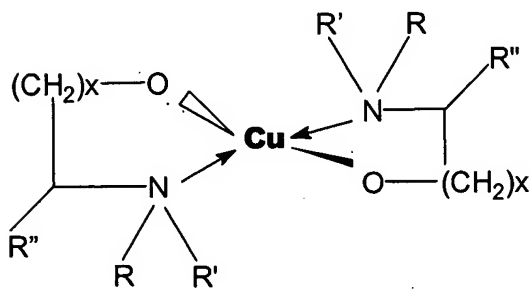
(III)

wherein:

x is an integer having a value of from 0 to 4; and

each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl.

9. A copper (II) precursor of formula (IV):



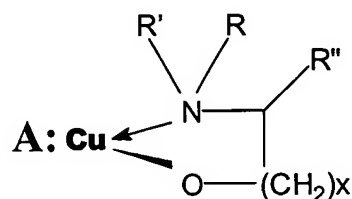
(IV)

wherein:

x is an integer having a value of from 0 to 4; and

each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl.

10. A method of depositing copper on a substrate, comprising contacting the substrate with a vapor of a copper precursor under chemical vapor deposition conditions, wherein the copper precursor comprises a copper precursor of formula (I):



(I)

wherein:

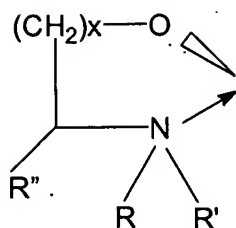
Cu is Cu(I) or Cu(II);

x is an integer having a value of from 0 to 4;

each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl;

when Cu is Cu(I), A is a Lewis base;

when Cu is Cu(II), A is:

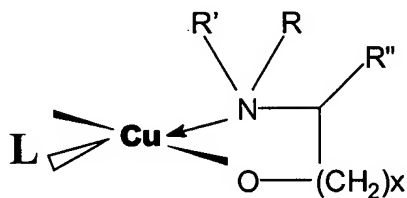


11. The method of claim 10, wherein Cu is Cu(I).

12. The method of claim 11, wherein the Lewis base is selected from the group consisting of alkenes, alkynes, dienes and diynes.

13. The method of claim 11, wherein the Lewis base is selected from the group consisting of alkene, diene, cycloalkene, cycloodiene, cyclooctadiene, cyclooctatetraene, alkyne, substituted alkyne (symmetrical or asymmetrical), amine, diamine, triamine, tetraamine, ether, diglyme, triglyme, tetraglyme, phosphine, carbonyl, dialkyl sulfide, vinyltrimethylsilane, and allyltrimethylsilane.

14. The method of claim 10, wherein the copper precursor has the formula (II):



(II)

wherein:

x is an integer having a value of from 0 to 4;

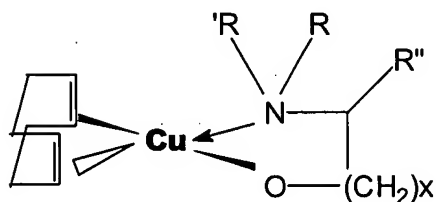
each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl; and

L is a Lewis base coordination species.

15. The method of claim 14, wherein the Lewis base coordination species is selected from the group consisting of alkenes, alkynes, dienes and diynes.

16. The method of claim 14, wherein the Lewis base coordination species is selected from the group consisting of alkene, diene, cycloalkene, cyclodiene, cyclooctadiene, cyclooctatetraene, alkyne, substituted alkyne (symmetrical or asymmetrical), amine, diamine, triamine, tetraamine, ether, diglyme, triglyme, tetraglyme, phosphine, carbonyl, dialkyl sulfide, vinyltrimethylsilane, and allyltrimethylsilane.

17. The method of claim 10, wherein the copper precursor has the formula (III):



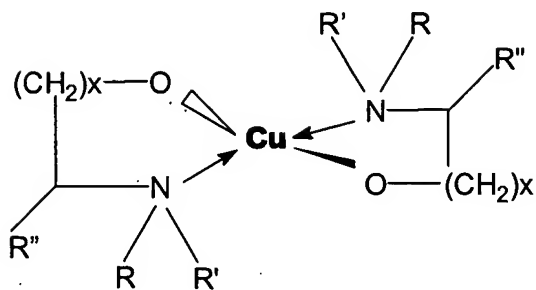
(III)

wherein:

x is an integer having a value of from 0 to 4; and

each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl.

18. The method of claim 10, wherein the copper precursor has the formula (IV):



(IV)

wherein:

x is an integer having a value of from 0 to 4; and

each of R, R' and R'' may be the same as or different from one another and each is independently selected from the group consisting of H, C₁-C₆ alkyl, C₁-C₆ perfluoroalkyl and C₆-C₁₀ aryl.